Curriculum Vitae
ANTONINA ROLL-MECAK

Cell Biology and Biophysics Unit
Porter Neuroscience Research Center
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Professional Appointments

2010 – present Investigator and Chief, Cell Biology and Biophysics Unit, National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, Maryland, U.S.A.

joint appointment, Biophysics Center, National, Heart, Lung and Blood Institute, National Institutes of
Health, Bethesda, Maryland, U.S.A.

Postdoctoral Training

2003 – 2009 Postdoctoral Fellow – Department of Cellular and Molecular Pharmacology, University of California, San Francisco
Postdoctoral Advisor: Professor Ronald D. Vale

Education

2002 Ph.D., Molecular Biophysics - The Rockefeller University, New York
Thesis Advisor: Professor Stephen K. Burley
Thesis Committee: Professor Gunter Blobel (Rockefeller University, New York)
Professor Brian Chait (Rockefeller University, New York)
Professor John Kuriyan (Rockefeller University, New York)
Professor Alfred Wittinghofer (Max-Planck Institute, Dortmund, Germany)

1996 B.E., *summa cum laude*, Chemical Engineering, Minor in Mathematics - The Cooper Union for the Advancement of Science and Art, Albert E. Nerken School of Engineering, New York

1992 Baccalaureate with high honors, Mathematics and Physics – Gheorghe Lazar Lyceum, Sibiu, Romania

Honors and Awards

2010	Special Act of Service Award from the National Institute of Neurological Disorder and Stroke, National Institutes of Health
2010 – 2013	Searle Scholar Award
2006 – 2013	Burroughs Wellcome Career Award in the Biomedical Sciences
2006 – 2011	K99/R00 NIH Pathway to Independence Award
2006	Larry L. Hillblom Foundation Fellowship Grant
2006 – 2010	American Heart Association Scientist Development Award (declined)
2006	L'Oreal-AAAS For Women in Science Fellowship Award
2003 – 2006	Damon Runyon Cancer Research Fund Postdoctoral Fellowship
2000 – 2002	Burroughs Wellcome Fund Predoctoral Fellowship
1997 - 2000	National Science Foundation Predoctoral Fellowship
1997 - 1999	The Kosciuszko Foundation Fellowship Grant
1996	The Henry W. Reddick Fund Prize and Medal for meritorious work in mathematics
1996	Willliam C. & Esther Hoffman Beller Fund for merit in engineering studies
1996	*Summa Cum Laude*, Cooper Union for the Advancement of Science and Art
1992 – 1996	Full tuition scholarship from The Cooper Union for the Advancement of Science and Art
1992 - 1996	National Dean's List, The Cooper Union for the Advancement of Science and Art
1995	Sigma Xi Rudin Fellowship for Summer Research
1994 – present	Member, Tau Beta Pi National Engineering Honor Society
1993	The Cooper Union Engineering Summer Fellowship
1991	Honorable Mention, Mathematics Olympiad

Funding

2010 – 2013	Searle Scholar Award

2006 – 2013	Burroughs Wellcome Career Award in Biomedical Sciences (discontinued upon joining the NIH intramural program)
2006 – 2011	K99/R00 NIH Pathway to Independence Award (discontinued upon joining the NIH intramural program)
2008 – 2009	Larry L. Hillblom Foundation Fellowship Grant
2006 – 2010	American Heart Association Scientist Development Award (declined)

Service

2012	Member, NINDS Search Committee for director of the NINDS Mass Spectrometry Facility
2011	Member, NINDS Faculty Search Committee for Stroke Branch Chief and clinical/translational tenure-track investigator
2010	Member, American Society for Cell Biology Meeting Abstracts Committee
2010	Co-organizer, NIH Research Festival Symposium: "Seeing the invisible: dissecting the mechanism of macromolecules across the scales"
2010 – present	Co-chair, NIH Scientific Interest Group on "Engineering and Physical Sciences"
2004 – present	Ad hoc reviewer: *Nature*, *EMBO J*., *Proceedings of the National Academy of Sciences, Journal of Biological Chemistry, Journal of Cell Biology, Journal of Molecular Biology, Human and Molecular Genetics, Disease Models and Mechanisms, Biopolymers, Journal of Cell Science*

Teaching and Mentoring

Summer 2012	Faculty, Physiology course - Marine Biological Laboratory, Woods Hole
Summer 2011	Faculty, Physiology course - Marine Biological Laboratory, Woods Hole
Spring 2011	Lecturer, Recent Discoveries in Molecular Biology (Biochemistry 539), Foundation for Advanced Education in the Sciences
Summer 2007	Teaching assistant, Physiology course - Marine Biological Laboratory, Woods Hole
2003 - 2009	Informal mentoring of rotation students in the laboratory of Professor Ronald D. Vale, University of California, San Francisco
2001 - 2003	Adjunct Professor of Biology - The Cooper Union for the Advancement of Science and Art, New York

	Independently designed and taught: Introduction to Molecular and Cell Biology, Biochemistry
2001-2002	Informal mentoring of a Summer Undergraduate Research Fellow (SURF) in the laboratory of Professor Stephen K. Burley, Rockefeller University
1993 – 1995	Undergraduate tutor, mathematics and physics - The Cooper Union for the Advancement of Science and Art, New York
1994	Independently taught lectures in Nuclear Physics – The Cooper Union for the Advancement of Science and Art, New York
1993	Teaching assistant for Quantum Mechanics - The Cooper Union for the Advancement of Science and Art, New York

Professional Societies

Member, American Society for Cell Biology

Member, Tau Beta Pi National Engineering Honor Society

Member, The American Institute of Chemical Engineers

Member, American Association for the Advancement of Science

Publications

15. Garnham, C. P. and **Roll-Mecak, A.** The chemical complexity of cellular microtubules: Tubulin post-translational modification enzymes and their roles in tuning microtubule functions. 2012. *Cytoskeleton*. 69(7):442-463.

14. Szyk, A., Deaconescu, A.M., Piszczek, G., **Roll-Mecak, A**. Tubulin tyrosine structure reveals adaptation of an ancient fold to bind and modify tubulin. 2011. *Nature Struct. & Molec. Biol*. 8(11): 1250-8. [cover]

13. Roll-Mecak, A. and McNally, F.J. Microtubule severing enzymes, 2010. *Curr. Opin. Cell Biol*., 22(1):96-103.

12. Roll-Mecak, A. and Vale, R.D. Structural basis for microtubule severing by the hereditary spastic paraplegia protein spastin. 2008. *Nature*, 451(7176): 363-7.

11. Roll-Mecak, A. and Vale, R.D. Making more microtubules by severing: a common theme of noncentrosomal microtubule arrays? 2006. *J. Cell. Biol.* 175 (6), 849-851.

10. Padyana, A. K., Qiu, H., **Roll-Mecak, A.**, Hinnebusch, A. G., Burley, S. K. Structural basis for autoinhibition and mutational activation of eIF2a protein kinase GCN2. 2005. *J. Biol. Chem.* 280(32), 29289-29299.

9. Roll-Mecak, A. and Vale, R. D. The Drosophila Homologue of the Hereditary Spastic Paraplegia Protein, Spastin, Severs and Disassembles Microtubules. 2005. *Curr. Biol.* 5(7), 650-55.

8. Roll-Mecak, A., Alone, P., Cao, C., Dever, T. E., and Burley, S. K. X-ray structure of translation initiation factor eIF2g: implications for tRNA and eIF2α binding. 2004. *J. Biol. Chem.* 279(11), 10634-10642.

7. Shin, B-S., Maag, D., **Roll-Mecak, A.**, Arefin, S.M., Burley, S.K., Lorsch, J.R., and Dever, T.E. Uncoupling the GTPase and Translational Activity of Initiation Factor eIF5B/IF2 by Mutations that Lower Ribosome Affinity. 2003. *Cell* 111, 1015-1025.

6. Deaconescu, A.M., **Roll-Mecak, A.**, Bonanno, J.B., Gerchman, S. E., Kycia, H., William, B.F., and Burley, S.K. X-ray Structure of Saccharomyces Mitochondrial Matrix Factor 1 (Hmf1). 2002. *Proteins* 42(2), 431-436.

5. Dever, T.E., **Roll-Mecak, A.**, Choi, S.K., Lee, J.H., Cao, C., Shin, B-S., and Burley, S.K. The Universal Translation Initiation Factor IF2/eIF5B. 2001. *Cold Spring Harbor Symp. Quant. Biol*. 66, 417-424.

4. **Roll-Mecak, A.**, Shin, B-S, Dever, T.E., and Burley, S.K. Engaging the ribosome: Universal IFs of translation. 2001. *Trends Biochem. Sci*. 26(12), 705-709.

3. **Roll-Mecak, A.**, Cao, C., Dever, T.E., and Burley, S.K. X-ray structures of the Universal Translation Initiation Factor IF2/eIF5B: Conformational Changes on GDP and GTP Binding. 2000. *Cell* 103, 781-792.

2. Choi, S. K., Olsen, D.S., **Roll-Mecak, A.**, Martung, A., Remo, K. L., Burley, S. K., Hinnebusch, A. G., and Dever, T. E. Physical and functional interaction between the eukaryotic orthologs of prokaryotic translation initiation factors IF1 and IF2. 2000. *Mol. Cell. Biol*. 20, 7183-7191**.**

1. Lee, J.H., Choi, S.K., **Roll-Mecak, A.**, Burley, S. K., and Dever, T. E. Universal conservation in translation initiation revealed by human and archaeal homologs of bacterial translation initiation factor IF2.1999. *Proc. Natl. Acad. Sci. USA*. 96, 4342-4347.

Selected Invited Talks

2012 – Caltech, Division of Chemistry and Chemical Engineering
2012 – Gordon conference "Biopolymers", Newport, Rhode Island
2012 – Brandeis University, Department of Biochemistry
2012 – University of Minnesota, Department of Genetics and Cell Biology
2012 – Symposium "Structural Analysis of Supramolecular Assemblies by Hybrid Methods", Lake Tahoe, California
2012 – Keystone meeting "Structural Biology of Cellular Processes: From Atoms to Cells", Keystone, Colorado
2011 – Wadsworth Center, Albany, New York
2011 – Centro de Neurociencias de Valparaíso, Valparaiso, Chile
2011 – Fundación Ciencia para la Vida, Santiago de Chile, Chile
2011 – "Emerging Concepts on Neuronal Cytoskeleton", Santa Cruz, Chile

2011 – Keystone meeting "AAA+ and Related ATP-Driven Protein Machines: Structure, Function and Mechanism", Granlibakken, Tahoe
2011 – National Institute of Diabetes and Digestive and Kidney Diseases, Laboratory of Biochemistry and Genetics, Bethesda
2011 – National Cancer Institute, Laboratory of Molecular Biology, Bethesda
2010 – National Cancer Institute, Cell Metabolism Branch, Bethesda
2010 – 40th MidAtlantic Protein Crystallography Meeting, Baltimore
2010 – University of Delaware, Department of Chemistry and Biochemistry, Newark
2009 – National Heart, Lung and Blood Institute, Laboratory of Cell Biology, Bethesda
2009 – National Cancer Institute, Laboratory of Macromolecular Crystallography, Frederick
2009 – Drexel University, Department of Neurobiology, Philadelphia
2008 – Yale University, Department of Molecular Biophysics and Biochemistry, New Haven
2008 – National Heart, Lung and Blood Institute, NIH, Biophysics Center. Bethesda
2008 – University of Chicago, Department of Cell and Molecular Biology, Chicago
2008 – University of Washington, Biochemistry Department, Seattle
2008 – National Institute of Neurological Disorders and Stroke, Bethesda
2008 – Northwestern University, Department of Biochemistry, Molecular Biology and Cell Biology, Chicago
2008 – University of Colorado, Department of Molecular, Cellular and Developmental Biology, Boulder
2008 – Laboratory of Molecular Biology, MRC, Cambridge, United Kingdom
2008 – Johns Hopkins School of Medicine, Department of Molecular Biology and Genetics, Baltimore
2008 – The Vollum Institute for Advanced Biomedical Research, Portland
2008 – University of Wisconsin, Madison, Department of Biochemistry, Madison
2008 – Fred Hutchinson Cancer Research Center, Basic Sciences Division, Seattle
2007 – University of California, Santa Cruz, Department of Chemistry and Biochemistry, Santa Cruz
2007 – Laboratory of Gene Regulation, National Institute of Child Health and Development, Bethesda
2006 – Institute of Molecular Biology, Academia Sinica, Taipei, Taiwan
2006 – Weill Medical College of Cornell University, Department of Physiology and Biophysics, New York
2003 – Institute for Molecular Pathology, Vienna, Austria
2003 – Mount Sinai School of Medicine, New York
2003 – Georgetown University, Department of Biology, Washington D.C.
2002 – International Union of Crystallography Congress, Geneva, Switzerland
2002 – Brooklyn Polytechnic, Bio-optics course, New York
2002 – Stanford University, Department of Biochemistry, Palo Alto
2002 – Yale University, Department of Molecular Biophysics and Biochemistry, New Haven
2002 – University of California at Berkeley, Department of Molecular and Cell Biology, Berkeley
2001 – University of Aarhus, Department of Molecular Biology, Aarhus, Denmark
2001 – Division of Eukaryotic Gene Regulation, National Institute of Child Health and Development, Bethesda
2001 – Wadsworth Center, Albany, New York